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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,041	02/16/2001	Yoichi Mizuno	0033-0693P	2528

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EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER-NUMBER
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1733

DATE MAILED: 06/20/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,041

Applicant(s)

MIZUNO, YOICHI

Examiner

Justin R Fischer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 and 3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2 and 3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka (US 5,859,142, newly cited) in view of Majumdar (US 5,503,940, of record), Matsue (US 5,420,193, newly cited) and Carter (US 5,807,918, of record). Muraoka discloses a rubber composition for use in a chafer of a heavy duty tire comprising (a) carbon black, such as N220 and N330, in an amount between 60 and 75 phr, (b) polybutadiene rubber having a syndiotactic crystal content between 6 and 17% in an amount between 30 and 70 phr (preferably 40 to 60 phr), (c) an additional diene rubber, such as natural rubber or isoprene rubber, in an amount between 30 and 70 phr, and (d) sulfur (S) and accelerator (A) in an amount that defines a ratio of S/A between 0.25 and 1.0 (Column 2, Lines 33-60 and Column 4, Lines 4-50). The reference, however, is silent with respect to (i) the inclusion of 1,3-bis(citraconimidiomethyl) benzene or BCI in an amount between 0.2 and 0.5 phr and (ii) the BET surface area of the carbon black. Regarding the inclusion of BCI, Majumdar describes the use of bis-imide compounds (specifically BCI [Tradename: Perkalink 900]) in an amount between 0.1 and 5 phr in tire rubber compositions formed of natural rubber and synthetic rubbers in order to **improve blowout resistance, reduce heat generation, improve durability, and**

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reduce reversion (Column 2, Lines 27-54 and Column 3, Lines 13-21). With respect to the surface area of the carbon black in Muraoka, many of the conventional carbon blacks, including some of those disclosed by Muraoka, used in the tire industry have a BET surface area that falls within the broad range of 70-120 m²/gram, as evidenced for example by Carter (Column 5, Table I) and Matsue (Column 5, Lines 60-67). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to (a) include BCI in an amount between 0.2 and 0.5 phr and (b) include carbon black with a BET surface area between 70 and 120 m²/gram, in view of Majumdar, Carter, and Matsue, for the benefits detailed above.

It is initially noted that the chafer rubber composition of Muraoka is provided to avoid deformation in the bead, rim chafing, and cracking (Column 1, Lines 65-67), which is analogous to the problems addressed by the claimed invention and described in the argument section of Paper Number 9 (Pages 4 and 5).

While Muraoka fails to suggest the use of BCI, anti-reversion agents in general are conventionally employed in tire components, especially those containing natural rubber, in order to eliminate the reduction in crosslink density and ultimately increase the strength and durability of the respective tire component. Majumdar, in turn, suggests the use of BCI in an amount between 0.1 and 5 phr in order to, among other things, **reduce heat generation, improve durability, and reduce reversion**, all of which are known to be desired characteristics of rubber chafer compositions (Column 3, Lines 13-21). It is additionally noted that Muraoka specifically suggests that the chafer rubber composition have high hardness, high durability, and high aging resistance (Column 1, Lines 28-32). Thus, in view of the recognized benefits of BCI and the

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properties desired by Muraoka, one of ordinary skill in the art at the time of the invention would have readily appreciated the employment of BCI in the chafer rubber composition of Muraoka since (a) anti-reversion agents are conventionally used in tire rubber components and (b) said benefits are analogous to the well known and desired properties of rubber chafer compositions, which are also disclosed by Muraoka. It should be noted that although Majumdar is primarily directed to a composition in the carcass/tread region (cushion layer), the reference in no way suggests that the benefits of BCI are specific to these tire components and as such, one of ordinary skill in the art at the time of the invention would have readily appreciated and expected the aforementioned benefits to have been realized in additional tire components, including the chafer.

Regarding the carbon black, Muraoka suggests a chafer rubber composition having carbon black (e.g. N220, N330) in an amount between 60 and 75 phr, which falls entirely within the broad range of the claimed invention. While Muraoka does not provide the BET surface area for said carbon black, many of the conventional carbon blacks disclosed by Muraoka have BET surface areas that fall within the broad range of the claimed invention. For example, Carter provides an example in which carbon black N330, which is suggested by Muraoka, has a BET surface area of 75 m²/gram (Column 5, Lines 50-65). Additionally, Matsue provides an example in which carbon black N220 has a BET surface area of 119 m²/gram and carbon black N330 has a BET surface area of 82 m²/gram, both of which are suggested by Muraoka (Column 5, Lines 60-68). As such, it is evident that one of ordinary skill in the art at the time of the invention would have readily appreciated the use of carbon black having a BET surface area between

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70 and 120 m²/gram since it defines a wide range of well known and extensively used carbon blacks in the tire industry.

Response to Arguments

3. Applicant's arguments with respect to claims 2 and 3 have been considered but are moot in view of the new ground(s) of rejection.

It is initially noted that the rejection of claims 2 and 3 with Takada has been withdrawn in light of the amendment to claim 2 filed January 31, 2003.

Regarding the experimental data of Tables 3 and 4, it should initially be noted that these results are not commensurate in scope with the limitations of claim 2. As currently drafted, claim 2 is directed to a rubber composition that is **useable as a chafer component**. However, the realized benefits set forth in Table 3 are specific to the rubber composition when it is used in a tire as a chafer (i.e. the table fails to provide "unexpected results" for the rubber composition in general).

In examining the results with respect to claim 3 (tire having chafer), the data is not found to be persuasive in establishing an **unexpected** criticality for the inclusion of BCI in amount between 0.2 and 0.5 phr. Example 1 and Comparative Example 3 have the same base rubber formulation and differ only in the amount of BCI (0.2 BCI versus 0.7 BCI). In this instance, though, the composition of Comparative Example 3 results in a lower hysteresis, the same hardness, the same breaking strength properties (before and after aging), and a higher elongation at break (before and after aging). Furthermore, the rubber compositions of Example 2 and Comparative Example 3 have the same base rubber composition (differ in BCI amount) and exhibit almost the identical properties for each of the aforementioned performance measurements. Thus,

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applicant has not established any criticality for the claimed range of 0.2-0.5 phr for BCI.

It should additionally be noted that Majumdar attributes the reduction of hysteresis,

increased durability, and reversion resistance to the use of BCI within the claimed

amounts. As such, one of ordinary skill in the art at the time of the invention would have

expected the rubber compositions of Takada to exhibit improvements in these areas

upon the introduction of BCI in an amount between 0.1 and 5 phr, which incorporates

the entire range of the claimed invention. Furthermore, as set forth in the rejection

above, Muraoka teaches the inclusion of sulfur and accelerator in the chafer rubber

composition such that S/A is between 0.25 and 1.0, which includes all of the values

required by the claimed invention. In this instance, it would have been within the

purview of one of ordinary skill in the art at the time of the invention to appropriately

select an S/A ratio in accordance to the range of the claimed invention depending on

the specific rubber composition. It is noted that Muraoka specifically suggests that a

large S/A (greater than 1) results in decreased thermal aging properties and a small S/A

(lower than 0.25) leads to processing difficulties.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

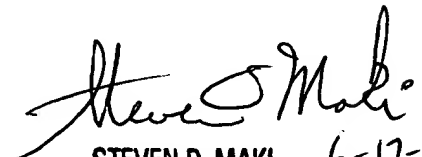
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(703) 605-4397**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Justin Fischer

June 17, 2003


STEVEN D. MAKI
PRIMARY EXAMINER
GROUP 1300
Av 1733 6-17-03